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Virtual Reference has been provided in libraries since the early 1900s. It started with the E-mail Reference Service, and in the mid-1990s it continued with Chat Reference Service. However, the Chat Reference Service and the E-mail Reference Service present special characteristics that influence the questions users ask through them.

The present study analyses, categorizes, compares and highlights the differences and similarities of the questions received through these 2 virtual reference services in Walter Royal Davis Library, the main academic library of the University of North Carolina at Chapel Hill. Despite the differences, Policy and Procedural questions are the most common ones in both services, which are distinct from the Reference Transactions traditionally expected.

The results of the study will contribute to the LIS literature regarding virtual reference services. Also, they will be especially helpful to the researcher's home institution in its implementation of the Chat Reference Service.

Headings:

Academic libraries -- Reference services

Electronic reference services (Libraries)

Instant messaging

Internet in library reference services

Library reference services -- Evaluation

Online information services

A COMPARISON OF THE QUESTIONS ASKED BETWEEN THE CHAT  
REFERENCE SERVICE AND THE E-MAIL REFERENCE SERVICE IN AN  
ACADEMIC LIBRARY

by  
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## **Introduction**

Libraries need to be responsive to actual users' needs, demands, and expectations. The analysis of what users are asking and the depth of information needed can help libraries to take relevant managerial decisions, as well as to create new and better virtual and on-site services.

Nowadays, librarians handle different types of services at one reference service point. These services include Reference Transactions, but also other information requests, such as directional transactions. Literature about this topic has typified the questions received in the reference environment, and attending to the type of institution and mean, these present great varieties in length and depth.

Besides the traditional face-to-face reference service, libraries provide reference services through a combination of means: by telephone, by fax, and also in a virtual way through their websites.

Regarding "Virtual Reference", the Reference and User Services Association (RUSA) of the American Library Association (2010) defines this concept mentioning that it is a reference service provided by librarians to remote users, through the use of computers or other technology. The communication channels used for this purpose can be chat, e-mail, and instant messaging, among many others. Cassell (2010) states that the basic models for virtual reference for remote users are e-mail, web-based chat, and (IM) instant messaging, but that it can also be done through text messaging (also known

as SMS for *short message service*) and through social networking tools (Facebook, Twitter, YouTube, MySpace). All these types of virtual reference services complement each other, and if implemented in a library, they need to be integrated with traditional reference and also with the rest of other services.

Regarding Chat Reference Service and E-mail Reference Service, both are virtual reference services intended to satisfy the information needs or questions of remote users. In comparison with face-to-face reference service, Chat Reference Service and E-mail Reference Service don't allow verbal (tone of voice, hesitation, etc.) and nonverbal cues (body language). However, users can save the response received by the librarian, which lessen the possibilities of committing transcription errors or misunderstanding the librarian's response. Chat Reference Service and E-mail Reference Service have some special characteristics:

- Chat Reference Service is a synchronous online session or a real-time communication exchange that responds to a sense of immediacy and urgency from the user. This service gives the opportunity for librarians to conduct the reference interview, interaction in which users may write several sentences and formulate different kinds of queries within the same session. However, librarians may feel more pressure in responding quickly with no delay, and as a result, the answers provided to the user may be shorter than in an E-mail service. This communication tool also provides users the privilege of anonymity and informality (abbreviations and lingo), which may make them feel more comfortable and familiar with the service.

- On the other hand, the E-mail Reference Service is asynchronous, or in other words, not done in “real-time”, which means that the question and the answer may be formulated, viewed and/or responded at different periods of time by the librarian and the remote user. So E-mail Reference Service doesn’t guarantee an immediate or quick answer from the librarian. E-mail Reference Service doesn’t give a chance for the reference interview and the questions that users ask without that interaction are usually short and focused on one particular topic. In contrast, as librarians don’t feel much pressure, they have more time to elaborate on what they feel may be a more complete and longer response.

About the history of E-mail Reference Service, most of the authors agree that it started in the early 1900s. Regarding Chat Reference Service, there is some consensus that libraries started offering it since the mid-1990s.

So, to find out about the questions asked in virtual reference services, the hypothesis of the present study is the following: *Because of the characteristics of the different means, the categories of questions asked by users through the Chat Reference Service and through the E-mail Reference Service are also different, and include more than Reference Transactions.*

The Research Questions are:

1. What categories of questions do users ask through Chat Reference Service?
2. What categories of questions do users ask through E-mail Reference Service?
3. Are the categories of questions that users ask through Chat Reference Service different from the questions they ask through E-mail Reference Service?

4. Are the categories of questions asked through both virtual reference services only Reference Transactions?

To respond to the research questions, a study is done in Walter Royal Davis Library, the main library of the University of North Carolina at Chapel Hill (UNC-CH), which provides in its website the two virtual services studied. The Chat Reference Service is provided through the “Chat with a Librarian” and the “Ask A Librarian - Instant Messenger (IM)” options. The E-mail Reference Service is mainly provided through the “E-mail Us” option.

So, the present paper studies the questions asked by users through the Chat Reference Service and the E-mail Reference Service in Walter Royal Davis Library. The methodology used is content analysis of the transcripts, a qualitative assessment that adds dimension to what is already known about these two virtual reference services.

Reference Transactions and other questions that users ask in the physical and virtual reference desk environment constitute effective feedback from users. But, what are Reference Transactions? Two well-known organizations have defined this concept: RUSA of the American Library Association and the Association of Research Libraries (ARL). Their definitions present some common elements: the presence of information consultations or information contact in a library setting, the interaction between a member of the library staff and a user, the presence of particular information needs expressed by the user, and the assistance provided to the user by the member of the library staff, which involves the interpretation, evaluation, and instruction in the use of one or more information resources (Reference and User Services Association (RUSA) of the American Library Association, 2008). Both definitions agree that the term include



information services provided by librarians about information sources, and that Reference Transactions exclude directional transactions.

The results of this study will contribute to the LIS literature regarding virtual reference services. Also, they will help develop the Chat Reference Service at the Library System of Pontificia Universidad Catolica de Chile (SIBUC). SIBUC already has an E-mail Reference Service, which has been placed in its website for 4 years. Nevertheless, when it was first implemented, reference librarians were afraid of this service and of the questions they would receive. So, for this second stage, which is the Chat Reference Service, it will be necessary to sensitize librarians again and break their fear for change. In order to be able to train librarians on the type of questions they will receive in the Chat Reference Service, it is necessary to typify these questions, and compare them with the ones received through E-mail. In this way, librarians will know the differences between these 2 virtual reference services and will be prepared to respond to the Chat Reference Service with more information and practical tools. Walter Royal Davis Library is an academic library that presents some similarities with the libraries at SIBUC, so, the results of the present study could be extrapolated and applied to it.

In this sense, authors agree that evaluation studies help to take better decisions and improve the services in an organization. Logan & Lewis (2011) state that “Assessment not only allows for informed decision making about resource allocation, but also provides information about ways to improve service.” (p. 218) “Since a good assessment is designed to answer a question and provide useful information, the loop should be closed by using the results to make improvements to the service” (Kern, 2009, p. 113).

## **Literature Review**

### ***Virtual Reference***

According to RUSA of the American Library Association (2010):

Virtual reference is reference service initiated electronically where patrons employ computers or other technology to communicate with public services staff without being physically present. Communication channels used frequently in virtual reference include chat, videoconferencing, Voice-over-IP, co-browsing, e-mail, and instant messaging.” (2.0 Definition of Virtual Reference section, para. 1).

The International Federation of Library Associations and Institutions (IFLA) (2008) states that virtual reference “must meet the same standards as traditional reference services.” (The Practice of Digital Reference section, para. 1) and provides useful guidelines “to promote digital reference best practices on an international basis.” (Purpose section, para. 1) Many authors have complemented this topic, and among them, Lipow (2003) wrote a handbook to help libraries in the development of virtual reference services, and Kovacs (2007) a handbook about the technical, communications, and reference skills for virtual reference librarians.

Tyckoson (2011) distinguishes 3 kinds of technology: technology that stores information, that reproduces it, and that communicates. So, virtual reference responds to this last kind of technology: technology that communicates. Tyckoson (2011) argues that since the arrival of technology, all that has changed in the reference service over the years are the tools and the communication channels used for providing the service. Among them, RUSA of the American Library Association (2010) includes “chat, videoconferencing, Voice-over-IP, co-browsing, e-mail, and instant messaging.” (Definition of Virtual Reference section, para. 1).

RUSA of the American Library Association (2010) also states that virtual reference must be integrated with traditional reference, or face-to-face reference services, and be treated as part, and also as “an extension of an institution’s existing reference services.” (Organization of Service section, para. 1), assigning it the same status and quality goals.

According to Bridgewater & Cole (2009) “virtual reference can be a very easy, extremely low-cost way to extend services to previously unserved or underserved patrons and enhance services to patrons you are already serving well.” (p. 13), or in other words, it represents an opportunity to reach a new segment of users: remote users. Heise & Kimmel (2003) complement this idea by commenting that traditional library services are valuable, but perceived to be less accessible by users, so librarians have to focus on a new community of online users. Bridgewater & Cole (2009) summarize that other advantages for implementing virtual reference services are that people are increasingly online and that virtual reference can be inserted in their online experiences allowing libraries to be competitive and provide integral reference services.

Finally, Logan & Lewis (2011) affirm that “Today, the library community recognizes that the ability to communicate with users in a variety of ways is very important: e-mail, chat, text, phone, and in-person.” (p. 220), and Bridgewater & Cole (2009) mention that there are three basic models that complement each other for providing virtual reference services: web-based chat, instant messaging (IM), and e-mail.

### *Chat Reference Service*

The creation of this service responds to the increasing number of online services and resources offered by libraries, as well as to the increasing number of online users. Chat Reference Services are provided through web-based chat and instant messaging (Bridgewater & Cole, 2009).

Ronan (2003) says that Chat Reference Service is a real-time or synchronous reference service for remote users, and that there are some factors that support offering this kind of service, such as: the increasing number of online users, and better connectivity and networking technology. Kern (2009) states that a synchronous transaction may be understood as a computer-mediated communication occurring in real time. Cassell & Hiremath (2011) state that “The advantage of chat reference is that the reference interview can be used successfully in this format. There is an opportunity to communicate back and forth with the user, and an opportunity for providing guidance the user can use in future queries.” (p. 25). Heise & Kimmel (2003) reaffirm these previous ideas, but also state that chat programs have special features that make the experience more enjoyable, and that it offers the benefits of anonymity to the users, which alleviates them from the embarrassment of asking for help.

According to Ronan (2003) and Barbier & Ward (2005) the reference interview online presents many challenges because there is no body language (no visual and audio clues, such as gestures and vocal intonations). Ronan (2003) suggests some behavioral guidelines similar to the ones that apply to the face-to-face interview, but with some particularities. RUSA of the American Library Association (2010) states that virtual

reference requires effective communication skills and training because the user is not present.

Bridgewater & Cole (2009) define IM as “an internet service that allows users to communicate with one another directly in real time” (p.27), or in other words, systems such as AIM, Yahoo! Messenger, MSN Messenger, and GoogleTalk that facilitate connections between known users. Kern (2009) specifies that IM is quite similar to web-based chat because is text-based and computer-facilitated, and that the only difference is the software used.

On the other hand, Ronan (2003) defines web-based chat as “any program that creates a chat window on a web page, allowing users to exchange messages with a librarian without having to install a special piece of software on their computers.” (p. 17) and Bridgewater & Cole (2009) add that web-based chat can take the form of enterprise software or widgets embedded in the Website, which can be categorized as “hybrid” and “prepackaged”.

Regarding the differences between IM and web-based chat, Cassell & Hiremath (2011) state that IM is faster than web-based chat, but that allows less communication and shorter messages, and Pomerantz (2005) complements saying that “IM applications are being used by some libraries as a low-cost means of offering chat-based reference, because most IM applications are free” (p. 1,289) and that “Another advantage of IM applications for chat-based reference is that many younger computer users are already familiar with the technology” (p. 1,289). Lankes (2008) agrees with this last statement, and adds that IM is perceived more friendly and informal, because it allows case letters, abbreviations, smiley faces and emoticons.

Regarding web-based chat, Pomerantz (2005) and Lankes (2008) point out that because the use applications are designed especially for that kind of service, web-based chat allows more sophisticated functionality, such as multi-user environment of anonymous users, queues control, and the possibility to save transcripts automatically and develop statistics. At this last respect, RUSA of the American Library Association (2010) affirms that the reviewing of transcripts, and the analysis of statistics are crucial for evaluating the service.

### ***E-mail Reference Service***

E-mail Reference Service is asynchronous, or in other words, not done in “real-time”. Kern (2009) illustrates the previous statement by saying “E-mail allows users to send a message any time to a person who may or may not be online at the same time.” (p. 3), and as a consequence, the message received by the librarian can be stored and read some time after it was received, and the answer to that message can also be delayed, just as it happens to letters written on paper (but without shipment delays).

Cassell & Hiremath (2011) state that “Although e-mail reference is slower, it has the advantage of giving the librarian time to do some research and provide a more thorough response. The e-mail response should also invite the user to return for more information or to use the service again.” (p. 25)

### ***Evolution of the Chat Reference Service and the E-mail Reference Service***

Hudson (2011) states that “Reference librarianship in a virtual or online environment is by no means a new concept.” (p. 61) She identifies year 1993 as a

starting point for E-mail Reference Service, when the possibilities of utilizing the Internet for reference service were being explored by pioneer libraries. Hudson (2001) remarks that since then, libraries started incorporating various online tools that enabled them to offer in the late 20<sup>th</sup> century, real-time chat interaction services. Hudson (2001) mentions that nowadays libraries also offer text-based delivery services for mobile devices.

Most of the authors agree that E-mail Reference Service started in the early 1990s, but there are also some other assumptions. Kern (2009) states that “E-mail is the most common and oldest of the virtual reference communication tools. Libraries have been using e-mail for reference service for more than twenty years.” (p. 3) But Cassell & Hiremath (2011) formulate that libraries started offering E-mail Reference Service since the mid-1990s. And Coffman & Arrett (2004) comment that to provide traditional library services in the online environment, libraries have been experimenting with E-mail Reference Service, Chat Reference Service, and online media since the late 1990s (as cited in Kortz, Morris, Greene, 2006).

Regarding Chat Reference Service, Pomerantz, Luo, and McClure (2006) state that libraries have been offering it since the mid-1990s. Heise & Kimmel (2003) agree with this statement, adding that online chat service was initiated with the introduction of ICQ (“I seek you”) instant messaging computer program, which was released to the public in 1996. Hirko (2002) comments about the rapid expansion of real-time reference and commercial software diversity, saying that in 1999 there were only a few libraries experimenting with Chat Reference Service, but that the 2000s were the beginning of a new reference era. On the other hand, and regarding literature about chat-based reference, Pomerantz (2005) states that it appeared in distinct phases: in the first phase

(late 1990s) literature on new technologies and its potential was written by early adopters, and in the second phase (2000s) most of the literature published contains case studies, or in other words, discussions of new implementations in different environments.

### ***Walter Royal Davis Library***

Walter Royal Davis Library is the central library, and the largest and most comprehensive library for the humanities and social sciences in UNC-CH. It has 2.5 million volumes, 2 million government documents, and 3 million microforms. It provides access to print and electronic resources, as well as to on-site and virtual services. The library is constantly improving its services and inviting its users (faculty, students, and others) to use them and give feedback.

In Walter Royal Davis Library, Chat Reference Service was implemented in October 2001 (Chad Haefele, personal communication, August 2, 2012), and according to Andrews (2004), it started using Tutor.com's (formerly Library Systems and Services, LLC [LSSI]) Virtual Reference Toolkit. Bridgewater & Cole (2009) wrote that it was in year 2003 when University of North Carolina (UNC), Duke University, and North Carolina State University, in a collaborative effort, decided to extend their Chat and instant message reference services to the late-night hours, forming the Triangle Research Library Network (TRLN). In February 2004, the UNC University Libraries joined NCKnows (Pomerantz, Luo, & McClure, 2006), a pilot project supported by a grant under the Federally-funded Library Services and Technology Act (NCKnows, About NCKnows page, Who is NCKnows? section, para. 1). In 2008 the UNC University Libraries and these other cooperative institutions started using "Libraryh3lp", which now combines, within a single interface, the virtual reference services provided through web-based chat,



instant messaging and text messaging, and that adds extra features such as the ability to manage queues with multiple gateways and operators (Bridgewater & Cole, 2009).

The number of chat sessions that Walter Royal Davis Library receives increment each year, and in 2011 there were 14,357 chat sessions that lasted longer than 30 seconds (Chad Haeefe, personal communication, August 1, 2012).

According to Davis Library website (<http://www.lib.unc.edu/davis/>), Walter Royal Davis Library provides the following virtual reference services: “Chat with a Librarian”, “Ask A Librarian - Instant Messenger (IM)”, “Research Consultation”, “Subject Specialists”, “Text Us”, and “E-mail Us” services, each one of them with different characteristics. The UNC University Libraries also offers access to Social Media (Twitter, Facebook, and Blogs).

Regarding the Chat Reference Service, the website provides the following options:

- Chat with a Librarian: It is a web-based reference service (widget). In this option, that is also called “Need Help? Ask Us.” the user can choose between chatting with the Reference or Circulation sections. However, internally, questions get transferred back and forth between the two sections, depending on which desk is better suited to handle the questions. There is no easy way to differentiate the questions between the two sections, but it seems that the Reference section gets more traffic than the Circulation section (Chad Haeefe, personal communication, July 27, 2012).

- Ask A Librarian - Instant Messenger (IM): It is an instant messaging reference service, which allows users to chat via AIM, Yahoo! Messenger, MSN Messenger, and GoogleTalk.

As mentioned before, these two modalities are fully integrated through the software “LibraryH3lp”. Due to the collaboration with Duke University, and North Carolina State University, and also for being part of NCKnows, the UNC University Libraries have extended Chat Reference Service that allows them to operate 24/7. When the service is offline, or not attended by a UNC Librarian, the queries that users ask during certain days of the week, after 9:00 p.m. until midnight, go to the Triangle Research Library Network (TRLN), and when that option is not available, backup chat services are provided by NCKnows librarians.

The E-mail Reference Service was implemented in 1995 through the “E-mail Us” option, which annually receives a total of 660 queries, or in other words, 55 monthly queries (Gary Pattillo, personal communication, August 27, 2012):

- E-mail Us: This option is a simple Web form that asks the user for: his/her question, E-mail address, location, whether he/she can visit the UNC University Libraries in person, and where to send the question (Davis Reference, or Davis Circulation).

The website also provides other alternatives for more complex and specialized queries, which will not be considered in this study:

- Research Consultation: Through a “Research Consultation Request Form”, the service encourages students, faculty, post-docs, and visiting researchers to

send a research question. The form has many fields to be completed by the users, including personal information and research related issues.

- **Subject Specialists:** The users are encouraged to contact a specialized librarian for each school, department, or program. A complete list of library contacts by subject is provided, which include physical location of the librarian, telephone and E-mail.

### *Categories of Questions*

The information and library science literature has developed many classifications of questions received in reference service points, which are illustrated in Table 1.

Table 1  
*General reference types of questions*

<b>Tyckoson (2011)</b>	<b>Anderson &amp; Sprenkle (2006)</b>	<b>Katz (2002)</b>
Reader's Advisory, Ready Reference, Research Consulting, Subject Specialists Bibliographic Verification and Citation Interlibrary Loan and Document Delivery Instruction Literacy Programs Outreach and Marketing	Directional Questions Reference Questions Policy Questions	Direction Ready Reference Specific- Search Questions Research
<b>Grogan (1992)</b>	<b>De Groote, Hitchcock, &amp; McGowan (2007)</b>	<b>Beatty &amp; Cloutier (2012)</b>
Administrative and Directional Enquiries Author/Title Enquiries Fact-Finding Enquiries Material-Finding Enquiries Mutable Enquiries Research Enquiries Residual Enquiries Unanswerable Questions	Directional Questions Ready Reference Questions In-depth Reference Questions, and Consultations, Demonstrations	Directional Reference Technology Referral Other

Tyckoson (2011) distinguishes 9 different types of questions. Based on their experience in public libraries, Anderson & Sprenkle (2006) differentiate among Directional Questions, Reference Questions, and Policy Questions. Katz (2002) talks about two general types of queries: Known Item, and Information without Knowledge of a Specific Source. However, he also suggests a more finely drawn categorization: Direction, Ready Reference, Specific-Search Questions, and Research (Katz, 2002).

Attending to the nature of the practical response that is expected from the librarian, Grogan (1992) differentiates 7 groups of enquiries, and Beatty & Cloutier (2012) distinguishes 5 groups. As a conclusion, it is possible to say that two types of questions are present in all these categorizations: Directional and Research Queries.

Interesting was the study conducted by De Groote, Hitchcock, & McGowan (2007), who analyzed the questions asked at the traditional reference desk (in-person or over the phone) in an academic library. Based on these categories, Beatty & Cloutier (2012) also studied traditional reference desk activity in an academic library.

On the other hand, some studies have been done specifically for Chat Reference Service and E-mail Reference Service, which are illustrated in Tables 2 and 3 respectively. The literature found is mostly from the early 2000s, when virtual reference services were in their initial stage.

The literature regarding Chat Reference Service is illustrated in Table 2. Arnold & Kaske (2005), Marsteller & Mizzi (2003), and Sears (2001) have studied chat questions received in academic libraries. Kortz, Morris, & Greene (2006) analyzed public libraries, which attend a broader segment of users with more diversified interests.

Table 2  
*Chat reference types of questions*

ACADEMIC LIBRARIES	PUBLIC LIBRARIES
Arnold & Kaske (2005)	Kortz, Morris, & Greene (2006)
Directional, Ready Reference, Specific Search, Research, Policy and Procedural, and Holdings/Do you Own?	Homework and Research, Personal and Recreational Questions, Inappropriate and Prank Questions, and Crisis Questions.
Marsteller & Mizzi (2003)	
Reference, Facts/Ready Reference, Known Item, and Directional/Policy/Procedure.	
Sears (2001)	
Reference Questions: Ready-Reference, Specific-Search, and Research Questions. Policy & Procedural Questions: Database instructions, passwords, etc., and Library policy clarification. Directional Questions: Location within the physical library environment, Location of resources on the Libraries Web site, and Location of places within the city or state.	

As illustrated in Table 3, and since the E-mail Reference Service has been in libraries for a longer period of time than the Chat Reference Service has, literature is more extensive and varied. The categories are also larger, more detailed and adapted to the particular needs of the organizations, especially in relation to academic libraries. Schwartz (2004), Diamond & Pease (2001), Powell & Bradigan (2001), and Lederer (2001) studied E-mail reference questions in academic Libraries; Numminen & Vakkari (2009) in a consortium of public libraries; and Duff & Johnson (2001) in provincial, federal, university, city and special archives.

Table 3  
*E-mail reference types of questions*

ACADEMIC LIBRARIES	PUBLIC LIBRARIES	SPECIAL LIBRARIES (ARCHIVES)
Schwartz (2004)	Numminen & Vakkari (2009)	Duff & Johnson (2001)
By the type of question: Reference, Non-Reference, Known Item, and Mixed.	Reference Questions: Ready Reference (Known-Item Search, Known-Item Related Search, Fact Finding) and Subject-Based Research Questions (Topical Search, Research Question, Person Related Question).	Limited Help Questions: Administrative / Directional, Material Finding, Specific Form, Known Item, and Service Request.
By the type of answer: Statements, Factual, Provide, Instruct, Advise, and Need.	Policy and Procedural Questions: On Availability and use of E-resources, On Library Policy Clarification and the Availability of a Specific Library Service.	Open-Ended Questions: Consultation and User Education.
By discipline: Humanities, Social sciences, Business, Science, and Interdisciplinary Questions.	Directional Questions: Location within the Physical Library Environment, and Location of Resources on the Library's Web Site.	
Diamond & Pease (2001)	Other Questions	
Catalog Look-Up and Use, Library Policies and Scope of Collections, Connectivity Questions, Database Mechanics, Questions Answered using Standard Reference Resources, Specific Factual but not Ready Reference, Navigating the Research Station, Information Literacy, Starting Points for Term Papers and Assignments, Non-Library Questions and Referral to Other Departments, and Non-Questions.		
Powell & Bradigan (2001)		
Access to Online Services, Citation Verification, Consumer Health, Database Searching Advice, Directory Information, Holdings Information, Library Services, Professional Information, and Statistical Information.		
Lederer (2001)		
Reference, Morgan Library (CSU's Main Library) Related, Library Department, University Related, Bibliographic Citation, Loan/Reserve, In Depth, SAGE-Library Catalog, Dissertation found Here, Own Dissertation, PIN #, Interlibrary Loan, Refer out of Library, Access to Databases, Database Specific, World Wide Web, Re: Service Itself (Other Librarians), Selling own Book, Donation, and Empty (No Question).		

Comparing Chat questions with E-mail questions in an Australian academic library, Lee (2004) concludes that the questions asked in these two modalities are in some respects similar, and that they receive the same proportion of questions about finding known items. However, he found out that the Chat Reference Service received a higher proportion of research and reference enquiries, as well as questions about accessing databases and electronic resources, and that on the other hand, Email service tended to receive a higher proportion of questions about administrative issues, referencing and citation (Lee, 2004). He states that in the Chat Reference Service, the immediacy or urgency factor may shape the type of questions and that the interaction produced by the reference interview may alter initial questions and turn them into research and reference enquiries (Lee, 2004).

### ***Reference Transactions***

RUSA of the American Library Association (2008) provides the following definition for Reference Transactions:

Reference Transactions are information consultations in which library staff recommend, interpret, evaluate, and/or use information resources to help others to meet particular information needs. Reference transactions do not include formal instruction or exchanges that provide assistance with locations, schedules, equipment, supplies, or policy statements. (Reference and User Services Association (RUSA) section, para. 1)

The Association of Research Libraries (ARL) provides a similar definition, which adds some details regarding information sources:

A reference transaction is an information contact that involves the knowledge, use, recommendations, interpretation, or instruction in the use of one or more information sources by a member of the library staff. The term includes information and referral service. Information sources include (a) printed and nonprinted material; (b) machine-readable

databases (including computer-assisted instruction); (c) the library's own catalogs and other holdings records; (d) other libraries and institutions through communication or referral; and (e) persons both inside and outside the library. (Reference and User Services Association (RUSA) of the American Library Association, 2008, The Association of Research Libraries (ARL) section, para. 1)

It is important to notice that as RUSA, ARL specifies that Reference Transactions don't include directional transactions, which are information contacts for logistical use of the library (Reference and User Services Association (RUSA) of the American Library Association, 2008).

Tyckoson (2011) refers to the reference service as “The third and historically most recent function of libraries” (p. 6) indicating that this concept was born in the mid-to late-1800s, as a direct result of two 19<sup>th</sup> century ideals: universal education and free public libraries. Tyckoson (2011) also indicates that the role of the reference service is “to provide direct assistance to users in their search and retrieval of information” (p.6).

With the readings, it is possible to infer that despite the arrival of technology in 1876, the main functions of the reference service have remained the same over the years: to give assistance and instruction to the users, aid the readers in the selection of good information sources, provide factual information, and promote the library within the community.

### **Methodology**

According to the Literature Review exposed in the present paper, Chat Reference Service and E-mail Reference Service have their own particularities. Taking into consideration the differences between the two services, the purpose of the present paper

is to find out if the questions asked by users through these two services also differ, and if they include more than Reference Transactions. The research questions are:

1. What categories of questions do users ask through Chat Reference Service?
2. What categories of questions do users ask through E-mail Reference Service?
3. Are the categories of questions that users ask through Chat Reference Service different from the questions they ask through E-mail Reference Service?
4. Are the categories of questions asked through both virtual reference services only Reference Transactions?

To compare the questions received through both services, Walter Royal Davis Library was selected for the study. It is the largest library of the UNC University Libraries and it offers both services in its website, providing a unique and particular setting of librarians, collections, services and users.

For the Chat Reference Service the questions received through the “Chat with a Librarian”, “Need Help? Ask Us.” and the “Ask A Librarian - Instant Messenger (IM)” options were considered. These options appeared in different pages of the Walter Royal Davis Library website. Sometimes the user has the option of choosing the “Reference” or “Circulation” chat box:

Different chat boxes go to different places. We can create a box that goes to any target. So depending on which link you follow, you’ll find different ones that we thought were most relevant to those pages. Sometimes we put the box to go straight to circulation (I’d forgotten that one existed, to be honest), and sometimes a more generic one that just goes to the reference desk. (Chad Haefele, personal communication, July 27, 2012)

For the E-mail Reference Service, and to be able to compare similar level of questions in both services, only the “E-mail Us” option provided by the library’s website



was considered. As the Chat Reference Service doesn't provide the users an alternative for more specialized and complex queries, for analyzing the E-mail Reference Service the "Research Consultation" and "Subject Specialists" options were not included.

### *Sample*

The period of time selected for both reference services (Chat and E-mail) was the first semester of year 2012, and for each service, the period with the highest amount of questions received. To be able to compare the questions received in both services, it was decided that 150 sessions were going to be analyzed for each one of them.

Even though these virtual services don't ask the users to give their name, and due to confidentiality issues, private information such as names, places and E-mails was previously removed by the librarians in charge of these services.

For the Chat Reference Service, a total of 150 anonymous Chat sessions were analyzed. The transcripts of these sessions were provided by Mr. Chad M. Haefele, the librarian in charge of this service in the User Experience Department of the UNC University Libraries. The second half of February (2/16 – 2/31) was the busiest two week period for chats in Spring 2012. In those two weeks there were 562 Chat sessions that lasted longer than 30 seconds, or an average of 35 Chat sessions per day.

- From that period, the sample considered an average of 10 Chat sessions per day, which were randomly selected by Mr. Haefele: If a day had 10 Chat sessions, he included them all in the sample; if a day had more than 10 Chat sessions, he used a random number generator (<http://www.random.org/>); if

there were fewer than 10 Chat sessions on a given day, he selected others from another random day to make up the difference.

- Only the questions answered by UNC University Libraries were analyzed. This means that the questions received by the Triangle Research Library Network (TRLN) and NCKnows were not considered.
- Chat sessions that were shorter than 30 seconds were excluded from the sample, because according to Mr. Haefele they are often spam or the person didn't wait around for an answer.

For the E-Mail Reference Service, a total of 150 anonymous E-mails (sessions) were analyzed. The transcripts of the sessions were provided by Mr. Gary N. Pattillo, reference librarian of the Research and Instructional Services at UNC University Libraries. The period of time selected was the busiest of Spring and Summer 2012 terms, specifically from February 15 to June 6, and all the questions received during that time were included in the study.

### ***Content Analysis of Transcripts***

Many different categories of reference question have been developed by researchers along the years, and some of them are described in the Literature Review of the present paper. Based on those categories, and also on the analysis of the sessions included in the sample, the present study creates its own categories of questions for the Chat Reference Service, and for the E-mail Reference Service.

So, to be able to categorize the Chat and E-mail questions, all the questions included in the sample were analyzed, process that was done through content analysis of

the transcripts of the Chat sessions and the transcripts of the E-mails received, which were the units of analysis of the present study.

At this point, it is important to mention that the analysis of transcripts is a methodology used in several studies related to virtual reference services, not only to evaluate the kind of questions that users ask, but to evaluate different aspects of the service. Ronan (2003) and Pomerantz (2008) state that from the libraries' perspective, transcripts of sessions assist in the evaluation of reference services. Arnold & Kaske (2005) add that "Chat service transcripts provide an excellent way to examine the quality of reference transactions for any library or group of libraries." (Introduction section, para. 1) and they describe a quantitative study done in a university chat reference, where librarians, in order to study the types of questions that were being asked by the users as well as other issues, analyzed 351 chat transcripts. Pomerantz, Luo, & McClure (2006) described the experience of a group of librarians, that from a peer reviewed perspective, reviewed a sample of 429 chat reference transcripts, arriving to significant conclusions regarding the quality of virtual reference service and the skills and engagement of the librarians providing it. Barbier & Ward (2005) analyzed the case of a public virtual reference service, in which a group was formed to evaluate and select the best chat of the month through the analysis of the transcripts. White, Abels, & Kaske (2003) analyzed transcripts to evaluate the completeness and accuracy of the answers provided by librarians and the whole quality of the Chat Reference Service. Radford & Connaway (2010), from a study that analyzed a sample of 850 chat reference transcripts in an academic library, reported research results regarding waiting time of users and interpersonal communication of librarians.

Pomerantz, Luo, & McClure (2006) state that the analysis of transcripts is the perfect method to develop an unobtrusive evaluation in virtual services, because it gives the opportunity to work with real questions from real users. Babbie (2010) defines content analysis as “the study of recorded human communications” (p. 333), as an unobtrusive research method for “studying social behavior without affecting it.” (p. 332). According to Trochim (2006), in the unobtrusive method researchers don’t interfere in the research context because they only study it in an indirect way, not being physically present. Trochim (2006) complements this by saying that “Unobtrusive measurement presumably reduces the biases that result from the intrusion of the researcher or measurement instrument.” (Unobtrusive Measures section, para. 2) Finally, as not being observed, users and librarians are not affected by the Hawthorne effect, and they don’t alter their natural stream of behaviors.

So, in total for the present study, 300 transcripts of sessions were analyzed. 150 from the Chat Reference Service and 150 from the E-mail Reference Service. The 300 transcripts were read three times. In total, the reading of the transcripts took 3 weeks: 1 week for each time that the transcripts were read.

In order to define specific categories for each service, the transcripts of the Chat Reference Service were read separately from the transcripts of the E-mail Reference Service. To provide consistency with the classifications made and the criteria chosen, each time that the transcripts were read, it was done all at once, in consecutive days.

- The first time was to have a general idea of what the questions were about, and to attempt defining categories and the criteria for classifying them.

- The second time was to classify the questions, applying to them the categories defined and the same criteria.
- The third time was to review the classification made for each question, and to provide consistency among them. At this stage, many changes were made in the classifications that had already been done.

### *Defining Categories and their Conceptualization*

Once the transcripts were carefully read, it was possible to define the categories illustrated in Table 4.

Table 4  
*Categories*

No.	CATEGORIES	CHAT	E-MAIL
	<b>Reference</b>		
1	Ready Reference		
2	Specific Search		
	<b>Online Resources</b>		
3	Resource Operation		
4	Problems with Access		
5	Help with UNC Services		
	<b>Policy and Procedural</b>		
6	Directional		
7	Service Issues		
8	Administrative Issues		
9	Special Cases or Personal Issues		
10	Suggestions / Complaints		
11	Reserve a Study Room		
	<b>Holdings/Do you Own</b>		
12	Online Resource or PDF Document		
13	Print or Audiovisual Material		
14	Not Determined or any Format		
	<b>Interlibrary Loan and Document Delivery</b>		
	Asked to UNC (External users)		
15	Books or other Print and Audiovisual Material		
16	Material Scanned or Photocopied or Online Access		
	Asked from UNC (Internal Users)		
17	Books or other Print and Audiovisual Material		
18	Material Scanned or Photocopied or Online Access		
	<b>Instruction</b>		
19	Online Resources or Programs		
20	Orientation		
21	<b>Bibliographic Verification and Citation</b>		
22	<b>Empty</b>		

*Note:* Color gray in some cells indicates that the category doesn't apply to that particular virtual reference service (Chat or E-mail).

In total, twenty two categories were created for the Chat Reference Service and for the E-mail Reference Service. Most of the categories are specific categories that form part of broader categories. Also, some of the categories apply to only one of the Reference Services: Chat or E-mail.

To define the categories, the following criterion was applied:

- If a session had more than one question, each question was counted separately.
- The questions were categorized in major categories, attending to the different types of questions presented in the Literature Review.
- However, it was noticed that some of those major categories defined in the Literature Review were too broad and didn't respond to the reality of the questions included in the sample. So, within some broader categories, more specific categories were developed.

### ***Categories and Conceptualization***

Each category defined for this study has an implied criteria or description (conceptualization), based in the Literature Review, but also adapted to the particular questions asked by the users of both services and that were included in the sample:

- Reference: These types of question strictly respond to the definition of "Reference Transaction" stated by RUSA and ARL. They reflect the users' need of finding specific information resources, related to particular topics.

These questions vary on complexity and represent different levels of difficulty for librarians.

Marsteller and Mizzy (2003) say that reference “Involves significant contemplation, knowledge or instruction on the part of the librarian.” (p. 164) and that reference questions may include guidance with databases or finding the right access points for a topic.

In the present paper “Reference” questions include “Ready Reference” and “Specific Search” questions.

- Ready Reference: These are specific questions about one single aspect, and that require a short and factual answer. According to Tyckoson (2011), examples of these questions are: what is the population of Washington? How many oranges were grown in California in 2012?

Arnold & Kaske (2005) define these types of questions as:

These are the typical ready-reference or data queries that require only a single, usually uncomplicated, straightforward answer. The requested information is normally found without difficulty in standard reference works, ranging from encyclopedias to almanacs and indexes. . . . Ready-reference queries may be divided and subdivided in many ways . . . Who? What? When? Why? Where? (Methodology section)

Katz (2002) has a similar definition. Marsteller and Mizzy (2003), Numminen and Vakkari (2009) and De Groote, Hitchcock, and McGowan (2007) specify that these are short answer type queries. Bopp & Smith (2011) add that they are specific questions that can be answered in an accurate or inaccurate way.

Grogan (1992) call them “Fact-Finding Enquiries” and he states that they are not always easy to solve and that “For their solution they demand the

provision of specific items of information and statistically they form the bulk of the enquiries received in libraries of all kinds.” (p. 39)

- **Specific Search:** These are general questions made by users about a specific topic, and that demand a search from the librarian, who ends up with a range of information of the topic or a list of citations and materials. The user will be the one who determines the extent and exhaustively of the research.

The definition of these types of questions can be taken from Arnold & Kaske (2005), who say that “Specific Search” answers imply giving the user a list of citations, or documents, and these types of questions can easily turn into “Research Questions”, which require detailed information for a specific question formulated from an adult specialist. Examples of these questions are: “Where can I find information on sexism in business? What is the difference between the conservative and the liberal views on inflation and unemployment?” (Arnold & Kaske, 2005, Methodology section)

In this study, for the type of media used (Chat and E-mail) the questions don’t get to be “Research Questions”, and if they do (through the Chat session), they are referred to “Research Consultation” or “Subject Specialists” services.

Grogan (1992) calls these questions “Material-Finding Enquiries”, and according to him, these are open-ended questions, and the most



demanding kind of queries, the ones that require skillful librarians with reference and bibliographic knowledge.

These type of questions would correspond to the “Research Consulting” reference service defined by Bopp & Smith (2011), who state that these requests are more common in academic libraries and that “In this case, the librarian may suggest sources, search terms, and pathways that will lead to material relevant to the research project. These questions do not have single, factual answers but have many possible results that vary depending on the researcher’s interests and needs.” (p. 15)

These questions would also correspond to the “Subject-Based Research Questions” defined by Numminen and Vakkari (2009), who state that they respond to the request of some kind of materials or clarification on a specific topic.

- **Online Resources:** It was necessary to create this broad category, because many of the questions involved the online resources and services available through the UNC University Libraries website and also in Internet. It seems that these kinds of questions started to appear in year 2001, with the great evolution of technology and Internet resources. However, for the present study, it was also necessary to narrow down this concept to a more specific categorization:
  - **Resource Operation:** Diamond & Pease (2001) name these kinds of questions “Database Mechanics”, and Lederer (2001) “Access to databases”. They involve features and use of specific online resources,

such as: “How do I find an article in a certain journal, limit my search to book chapters, or print only the abstracts of the article?” (Diamond & Pease, 2001, p. 213)

- **Problems with Access:** This applies for problems accessing databases or obtaining documents online (E-books, online journals). Diamond & Pease (2001) call them “Connectivity Questions”, saying that they involve questions such as: “How do I get access from home? What's the password? Is the server down?” (p. 213)
- **Help with UNC Services:** These questions are related to the online services available at the UNC University Libraries website, or to the automated E-mail notifications that the UNC University Libraries have implemented to maintain their users informed about the status of their accounts (overdue notices, recall notices, etc.). These questions were only asked through the Chat Reference Service.

In her study of Chat Reference Questions, Sears (2001) refers to them as “Database instructions, password, etc.” questions. An example of these is “I need to renew books. I cannot get the site to accept my name and barcode?” (Sears, 2001, Types of Questions section) However, Sears (2001) classifies them as part of the “Policy & Procedural” questions.

- **Policy and Procedural:** Many authors feel the need of defining questions that deal with requests not related directly to reference questions or “Reference Transactions”, but that imply library regulations, policies and procedures about services and collections, as well as physical and virtual location of

them. According to RUSA of the American Library Association (2008), these are not reference transactions because they only include queries related to policy statements, schedules, locations, equipment, or supplies.

Anderson & Sprenkle (2006) specify that in order to satisfy users, they have to be answered with full explanations and good arguments, and that the questions usually begin with “Why does (doesn’t) the library...” . Arnold & Kaske (2005) believe that they begin with "How do I?". Schwartz (2004) states that being non-reference questions implies that they apply to the particular situation of each library, which can only be handled by personnel who know about the specific institution and its environment.

Grogan (1992) refers to them as “Administrative and Directional Enquiries”:

Enquiries about such elementary and routine matters make no call on the bibliographical expertise of the staff, merely a basic general knowledge of where things are and how things are done in a particular institution. They are scarcely the type of questions that require professional librarians to answer them, but they are frequently and genuinely asked by users in need of help and any library has an obligation to make provision for them to be answered in a friendly and helpful manner. Most would agree, however, that in a well-ordered library may such queries could be anticipated by a clear system of signs and notices. (p. 37)

- Directional: These types of questions are related to the location of virtual and on-site collections and services, people, and places. Many authors include them as part of the Policy and Procedural questions, because they are non-reference questions that can be answered in an information desk and that do not require the expertise of a librarian. Examples of these questions are: “Where is the catalog?, Where are the indexes?” (Arnold & Kaske, 2005, Methodology section), or "What floor is QL on?" (Sears,

2001, Types of Questions section) De Groote, Hitchcock, and McGowan (2007) state that these are “Questions regarding location of services, policies, collections and materials contained in the building or university. Example: Where are the restrooms?” (p. 24) Arnold & Kaske (2005) suggest that these types of question begin with “Where is” or “Where are”, and that their answer require very little time and only general knowledge about a particular institution.

Marsteller and Mizzy (2003) are even more updated and specific and state that these are “Queries that simply ask for directions for where something is physically or virtually located.” (p. 163) Numminen and Vakkari (2009) seem to agree with this definition and divide these questions in two: location within the physical library environment and location of resources on the library’s website.

- **Service Issues:** This is a subdivision that it was necessary to make attending to the specific nature of some questions received. It was believed that having this detail would contribute to the better analysis of the information. They include general questions related exclusively to policies, procedures and regulations of the services provided by Walter Royal Davis Library and the UNC University Libraries, such as loans, access to the library, opening hours, etc. Examples of these types of questions are: How much are the fines?, What happens if I lose a book? Duff & Johnson (2001) typify them as “Administrative / Directional” and state that they include information about costs of photocopying, hours of

library service, etc. However, in the present study another subdivision was necessary to make for the administrative questions, which greatly differ from the service questions already mentioned.

- **Administrative Issues:** To do this subdivision was also necessary in the present study because of the many questions received about jobs in the library, procedures about acquisition of materials (donation, purchase and exchange), information about the personnel or the technology used to provide services. Examples of these types of questions are: Do you receive donations?, Which is the name of the software that you use to provide services in the library?
- **Special Cases or Personal Issues:** These types of questions are not described in the literature and respond to specific inquiries made by users regarding their own particular situations, such as state of their loans, or renewals, missing books, fines and fees, etc. An example is: I would like to know how many books I have in my library account?
- **Suggestions / Complaints:** The literature doesn't refer to this type of questions either, which attend especial cases of users that manifest their discomfort with some aspects of the library services, such as lack of materials, limited opening hours, noise in the library, etc. Examples of these questions can be: Why don't you open the libraries until midnight?
- **Reserve a Study Room:** These types of requests are not mentioned in the literature, because they are very specific and apply only to the particular case of the UNC University Libraries. The requests to reserve a study

room were only made through the Chat Reference Service, and not through the E-mail Reference Service. These questions are like: Can I reserve a study room for tomorrow?

- **Holdings/Do you Own:** These types of questions refer to inquiries done by users that are looking for a particular work, either in its physical or online form. Examples are: Does the library owe the book “Gone with the wind”?, “Does the library subscribe CLASE / Periodica?” Arnold & Kaske (2005) define them as “Questions about specific holdings of a library. Normally the customer has the title of a book, journal, video, among other things and would like to know if the library owns the material.” (Methodology Section, Holdings/Do You Own? para.)

Grogan (1992) calls them “Author/Title Enquiries”, because the users are looking for a particular work, which they expect the library to hold. He states that these kinds of question are very common in academic libraries, and that they are very easy to answer because they only require from librarians a detailed knowledge of the collections and searching skills.

Marsteller and Mizzy (2003) call this kind of queries “Known Item” and state that they deal with the location of a book or journal.

In the present study, this kind of question was broad, and it was necessary to have the following distinctions:

- Online Resource or PDF Document
- Print or Audiovisual Material
- Not Determined or any Format

- Interlibrary Loan and Document Delivery: These questions are often a result of the “Holdings/Do you Own” type of questions. In the case of the E-mail service, both questions can be asked at the same time, but in the case of the Chat session, they turn into a “Recommendation for Interlibrary Loan and Document Delivery”, which is usually inferred by the user or suggested by the librarian. Examples of these types of questions may be: Is the book I just mentioned available for Interlibrary Loan?, Can I get this article online from another university?

Tyckoson (2011) states that “Interlibrary loan is the process of sharing material between libraries.” (p. 16) This process allows users to have more materials. Consortia help these issues, and OCLC is an example of it, because it has made this function much easier, raising the traffic among lending libraries.

In these questions the internal and external users want to know more about the Interlibrary Loan and Document Delivery services that their respective library or OCLC offers, and sometimes they ask about specific documents, in its print or online form.

- Asked to UNC (External users)
  - Books or other Print and Audiovisual Material
  - Material Scanned or Photocopied or Online access
- Asked from UNC (Internal Users)
  - Books or other Print and Audiovisual Material
  - Material Scanned or Photocopied or Online access

- **Instruction:** These questions demand guidance from the librarian on how to use information resources, library services and collections. In this case, users demonstrate interest in participating in the process of finding information. In order to develop self-sufficient and knowledgeable users, the main objective of librarians would be to help users, teaching them step-by-step instructions and appropriate criteria to search, use, and evaluate information by their own. An example of this type of questions is: Can you explain to me the steps you took in the Online Catalog for finding this list of articles?

In the Chat sessions, instruction sometimes is done by default by librarians, who teach the users at the same time they make the search. In the case of E-mails, users explicitly formulate a “Request for Instruction”.

Schwartz (2004) refers to them as “Instruct questions”, the ones that are specifically asked by users that have a conspicuous need of instruction on solving an information need, meaning that they want to find information, but also to learn by doing.

These questions correspond to what Tyckoson (2011) defines as direct instruction, one of the two forms of “Instruction” questions. “Direct instruction is characterized by the librarian communicating directly to the user and is delivered through any of a number of channels.” (Tyckoson, 2011, p. 17)

In the present study “Instruction” involves teaching users about the online resources or programs, or giving them some orientation to the library or to



some of its services. It can also include advice on issues related to research.

So these types of questions were subdivided in:

- Online Resources or Programs
- Orientation
- Bibliographic Verification and Citation: These questions are asked by users that want to clarify some aspects about their citation lists, complete their bibliographic citations, or ask for some advice on how to cite particular resources. Nowadays this type of questions are very common in academic libraries and a growing function for reference librarians, especially considering the different citation styles (MLA, APA, etc.) and formats (print and online resources), as well as the multiple research projects in which users are involved. Researchers need to correctly cite the resources that they have used, so others can also find them. An example of these questions would be:  
How do I cite this article using APA?  
Tyckoson (2011) states that “Bibliographic verification is the process of reading, identifying, and interpreting citation to information sources. Those sources include books, journals, theses, Web pages, manuscripts, or any other form of publication.” (p. 16)
- Empty: This kind of questions occurs in the Chat Reference Service when there is no question or when the communication is interrupted for no particular reason. Curiously, Lederer (2001) also recognizes this type of questions, but in the E-mail Reference Service.

### **Limitations**

The first limitation of the present study deals with the period of time the samples were taken, which could have been a source of internal invalidity due to the history effect. Even though both samples were taken from the first half of year 2012, as the Chat Reference Service daily receives more questions than the E-mail Reference Service, the sample for the first one considered a period of two weeks, and for the second one a period of almost 4 months. This fact could have influenced the type of questions received, especially through the E-mail Reference Service that took a longer period of time, while many academic events were occurring.

Problems of validity would also arise with the different selection of samples and the resultant comparison of the two reference services. As the Chat Reference Service was randomly selected from the busiest two week period for chats in Spring 2012, the sample could have some selection biases, and some types of questions asked may not be represented by this selection. In the case of the E-mail Reference Service all the E-mails received from the busiest period of Spring and Summer 2012 terms were included, so the questions represented the total universe of questions received during that period, which means that all of them had the chance to be represented.

It was not possible to identify the type of users (internal or external users) for neither of the two reference services, because the Chat and E-mail reference forms placed in the library's website don't ask for that kind of information. For this reason, it was not possible to associate particular kinds of questions to particular kinds of users, which would have been interesting for this study.

For the Chat Reference Service it was possible to analyze the questions, but also the answers, which was not possible to do in the E-mail Reference Service. As the E-mail Reference Service is provided through a Web form that is administered by a chief librarian that assigns the questions to different reference librarians, it was not possible to have centralized access to that information. As the answers given to the questions asked through E-mail were not provided, it was not possible then to determine if there were follow-up questions, if the initial question evolved into another kind of question (mutable inquiries), or if the final answer given to the user was successful. In further studies it could be interesting to analyze the answers for both kinds of services: Chat and E-mail.

As every categorization and conceptualization, the ones defined for the Chat and E-mail Reference Services may have problems of reliability, because another observer could have made completely different categories with the questions received. Also, analyzing the transcripts and classifying them within the categories defined was a subjective evaluation that could have been influenced by personal biases and points of view.

The sample of 150 transcripts for each Reference Service may have not been large enough to represent the differences among the 22 specific categories created, and allow a better comparison within the services. Further studies should consider doubling the size of the sample.

Finally, the present study only considered one library of the UNC University Libraries, Walter Royal Davis Library, which is an academic library that has its own particular characteristics. Further studies could consider a broader spectrum of academic libraries.

## Results

Attending to the categories defined, each question received through Chat Reference Service and through E-mail Reference Service was classified, which gives the following results for each Reference Service.

### *Chat Reference Questions*

Table 5 illustrates the 176 questions received through the 150 Chat sessions.

Table 5  
Questions received by chat

CATEGORIES	NUMBER	%
<b>Reference</b>	<b>25</b>	<b>14%</b>
Ready Reference	6	3%
Specific Search	19	11%
<b>Online Resources</b>	<b>20</b>	<b>11%</b>
Resource Operation	1	1%
Problems with Access	8	5%
Help with UNC Services	11	6%
<b>Policy and Procedural</b>	<b>73</b>	<b>41%</b>
Directional	18	10%
Service Issues	29	16%
Administrative Issues	2	1%
Special Cases or Personal Issues	5	3%
Suggestions / Complaints	0	0%
Reserve a Study Room	19	11%
<b>Holdings/Do you Own</b>	<b>32</b>	<b>18%</b>
Online Resource or PDF Document	18	10%
Print or Audiovisual Material	14	8%
Not Determined or any Format	0	0%
<b>Interlibrary Loan and Document Delivery</b>	<b>11</b>	<b>6%</b>
Asked to UNC (External users)		
Books or other Print and Audiovisual Material	1	1%
Material Scanned or Photocopied or Online Access	0	0%
Asked from UNC (Internal Users)		
Books or other Print and Audiovisual Material	1	1%
Material Scanned or Photocopied or Online Access	9	5%
<b>Instruction</b>	<b>5</b>	<b>3%</b>
Online Resources or Programs	5	3%
Orientation	0	0%
<b>Bibliographic Verification and Citation</b>	<b>8</b>	<b>5%</b>
<b>Empty</b>	<b>2</b>	<b>1%</b>
<b>TOTAL</b>	<b>176</b>	<b>100%</b>

As it can be appreciated, the “Policy and Procedural” questions are the most common ones asked through the Chat Reference Service, representing 41% of the total.

Does this mean that the core role of librarians is being left behind? Could the Chat Reference Service be attended by other staff different from librarians?

At this respect, it is interesting to notice that of the total of 176 questions; only 14% are “Reference” questions or “Reference Transactions”, and that 3% are “Instruction” questions.

But it is still satisfactory to verify that one of the main concerns of users is still present, and represented by questions related with finding and obtaining material, either in its print or online format. So, the “Holdings/Do you Own” questions represent 18% of the total, followed by “Online Resources” questions that represent 11% of the total, and by the “Interlibrary Loan and Document Delivery” questions that are the 6%.

It is interesting to know that 5% of the questions are related with “Bibliographic Verification and Citation”.

To illustrate some of the questions received in the Chat sessions, some examples of each kind of question are given. They are fragments of Chat sessions, which are reproduced just as they were written, some of them with misspelling, orthographic and grammatical errors.

- Reference
  - Ready Reference: Even though the literature mentions that these questions require a short and factual answer, in this study it was found out that sometimes librarians took more time answering these types of questions than the “Specific Search” ones. So, this proves that Grogan (1992) was right when he said that they are not always easy to solve.

User: Hi, could you please tell me what the key symbol mans [means] in Black's law dictionary...? I'm looking at a copy but can't find the explanation in the front of the book.

- Specific Search

User: Hi! I'm looking for information related to German POW's who worked as farm laborers in North Carolina during WWII

- Online Resources

- Resource Operation

User: How do I get an nclive.org password? I am a UNC student.

- Problems with Access

User: when I go directly to "Article" I get a message saying request can't be processed due to system error

- Help with UNC Services

User: Hello! I am attempting to set up a research consultation and I keep getting an error message – Is there another way to set this up?

- Policy and Procedural

- Directional

User: i [I] have a book i [I] need to find with the call number

Librarian: Hello

User: where is it located within davis [Davis]?

- Service Issues

User: what time do you close the library tonight?

- Administrative Issues

User: Hello! I was trying to remember the name of the system the libraries use for IM reference. I wanted to recommend it to a library I used to work for. Do you happen to recall what it is called?

- Special Cases or Personal Issues

User: Hi, I returned some reserve books to the reserve drop about 40 minutes ago and they are showing as overdue on my account. Is it possible for someone to check these in ASAP and, if possible, wipe the late fees?

- Suggestions / Complaints: There are no questions for this category.
- Reserve a Study Room: These types of questions were probably asked because on the Davis Library website, there is a page (<http://www.lib.unc.edu/davis/circ/groupstudies.html>) that says “Please contact the Circulation Department if you have any questions about Group Studies in Davis Library.” (Reserve a Group Study Room section, para. 4). This paragraph gets to a page where there is contact information, and among it, the Chat alternative.

User: I’d like to reserve a room for today please.

- Holdings/Do you Own: Sometimes it was not clear for the users if the material they wanted was available online or in print format in the UNC University Libraries. So some of the questions started very vague, and librarians helped out clarifying them, which means that a request for an online resource could have ended up being a request for a print resource. For tabulating the questions, the options suggested by librarians during the Chat sessions were considered. Even though in the Chat sessions the users were not asked to identify themselves, in this type of questions it was easy to infer that most of the users belonged to UNC-CH.
- Online Resource or PDF Document

User: Good afternoon, is there a good thesaurus in e-research tools?

- Print or Audiovisual Material

User: Hello, can you help me find out if we have access to old issues of variety magazine?

- Not Determined or any Format: There were no questions for this type.
- Interlibrary Loan and Document Delivery: Most of these questions are a result of the “Holdings/Do you Own” ones, after it is found that the materials needed are not available in the UNC University Libraries. In these types of questions, there is usually a recommendation from the librarian to use the interlibrary loan service. Other times, this alternative is inferred by users who ask for more information about it.

Even though during the Chat sessions users were not asked to identify themselves, sometimes by the type of questions and the ways they were asked, it was easy to infer if the user belonged or not to UNC-CH. So, it is possible to estimate that 91% of these types of questions came from internal users that belong to the university.

- Asked to UNC (External users)
  - Books or other Print and Audiovisual Material

User: Hello. I am doing a research project over the Kent State Massacre and my history professor told me I would be able to attain copies of books through interlibrary loan. Is this true? If so, how does it work?

Librarian: Hi.

Librarian: Are you a UNC student?

User: No, I am a student at Anderson University.

- Material Scanned or Photocopied or Online access: There were no questions for this category.
- Asked from UNC (Internal Users)



- Books or other Print and Audiovisual Material

User: we do not have this book it appears: [confidential information]

User: i [I] was wondering if i [I] could get it from ILL

- Material Scanned or Photocopied or Online Access

Librarian: We don't subscribe to Labmedica, but you can fill out an Interlibrary Loan request and we'll try to find it and get it to you!

- Instruction: In Chat sessions, the instruction sometimes is done by default by librarians, who put into words the steps they are following while they are conducting their search. In other cases, it is explicitly asked by users.

- Online Resources or Programs

Librarian: ok, i [I] included the terms pig and swine in my search so that it looks like this now: Concentrated Animal Feeding Operations AND north Carolina AND (pig\* OR swine)

- Orientation: There are no questions for this category.
- Bibliographic Verification and Citation

User: Hi. I'm trying to cite information I found from a graph using statista in APA and I'm having trouble finding the proper way to do this.

- Empty

User: test chat

### *Mutable Inquiries*

Of the 150 Chat transcript sessions analyzed, it was observed that:

- 129 sessions had 1 question
- 16 sessions had 2 questions

- 5 sessions had 3 questions

Of the 21 sessions (16 + 5) that had more than 1 question, 19 sessions (13% of the 150 sessions) had 20 questions that were mutable enquiries, or in other words, questions that evolved through the Chat session, and turned into other types of questions.

According to Grogan (1992) a mutable enquiry is “the question that changes its character during the course of its investigation.” (p. 41) and he says that for example “what starts off as a fact-finding enquiry may emerge as a material-finding enquiry if the specific facts sought turn out to be disputed or obscure.” (p. 41)

Of the 21 sessions that had more than 1 question, only 2 sessions didn’t have mutable inquiries, and those were the cases when the users had very clear questions since the beginning of the Chat session.

So, it is interesting to notice that Chat sessions allow interaction between users and librarians, and that they favor mutable inquiries. This interaction seems to meet better the needs of the users, who can obtain immediate response to their enquiries, and if they are not satisfied, ask another question.

As we can appreciate in Table 6, there are eleven types of mutable inquiries. The mutable inquiries that are more common are the ones that evolve from “Holdings/Do you Own (Online or PDF document)”, to “Interlibrary Loan and Document Delivery (Material Scanned or Photocopied or Online Access)”. This is obvious, because the user that at first though was going to find the online material through the UNC resources ends up receiving information from the librarian about ways of obtaining it from other institutions. As an example, here is the following dialogue from a transcript, after the user had found out that the material was not available in UNC online resources:

- Initial question: “Holdings/Do you Own (Online or PDF document)”:

User: I need help finding a conference proceeding paper.

Librarian: what’s the citation

User: Hix et al. 2002, Proc. of 2nd Chicago Conferene [Conference] on Astrophysical Explosions

...

Librarian: there’s nothing in our catalog on that. i [I] can search worldcat for you

- Final question: “Interlibrary Loan and Document Delivery (Material Scanned or Photocopied or Online Access)”, which is a suggestion from the librarian:

User: Unfortunately I need this specific paper.

Librarian: You can put in an interlibrary loan request for it; they’ll try to find the paper.

Table 6

*Mutable inquiries*

	MUTABLE INQUIRIES	INITIAL QUESTION	LAST QUESTION	TOTAL OF QUESTIONS
1	From Holdings/Do you Own (Online Resource or PDF Document), to Recommendation for an Interlibrary Loan and Document Delivery (Material Scanned or Photocopied or Online Access)	6	6	12
2	From Reference (Specific Search) to Instruction (Online Resources or Programs)	4	4	8
3	From Holdings/Do you Own (Print or audiovisual material), to Policy and Procedural (Directional)	2	2	4
4	From Holdings/Do you Own (Online Resource or PDF Document), to Recommendation for an Interlibrary Loan and Document Delivery (Material Scanned or Photocopied or Online Access)	1	1	2
5	From Holdings/Do you Own (Online Resource or PDF Document), to Policy and Procedural (Service Issues)	1	1	2
6	From Holdings/Do you Own (Print or Audiovisual Material), to Online Resources (Help with UNC Services)	1	1	2
7	From Holdings/Do you Own (Print or Audiovisual Material), to Recommendation for an Interlibrary Loan and Document Delivery (Material Scanned or Photocopied or Online Access)	1	1	2
8	From Instruction (Online Resources or Programs) to Policy and Procedural (Directional)	1	1	2
9	From Policy and Procedural (Service Issues) Policy and Procedural (Directional)	1	1	2
10	From Policy and Procedural (Directional) to Policy and Procedural (Service Issues)	1	1	2
11	Online Resources (Problems with Access) to Holdings/Do you Own (Print or Audiovisual Material)	1	1	2
	<b>TOTAL</b>	<b>20</b>	<b>20</b>	<b>40</b>

It was also frequent to have “Reference (Specific Search)” evolve into “Instruction (Online Resources or Programs)”, because at first users start asking about a specific request for information in a certain topic, and then they end up asking librarians

how to better search for it. Also, in most of the sessions, librarians start teaching users while making the search. The following are fragments of a session:

- Initial question: “Reference (Specific Search)”:

User: I am about to write an article based on political communication

User: political advertising and propaganda during the elections, especially doing a comparison between US and Europe

- Final question: “Instruction (Online Resources or Programs)”:

Librarian: If you can get to that database from the political science databases link I sent you above, we can work on the search together.

User: Ok thanks!

.....

Librarian: Ok. So from the search page, I typed in the following things:

Librarian: First box: election\*

Librarian: The asterisk after election means that the database will search for election as well as elections. It's a wild card character.

Less common were the mutable inquiries evolving from “Holdings/Do you Own (Print or Audiovisual Material)” to “Policy and Procedural (Directional)”. As an example, we have the following fragments of a Chat session:

- Initial question: “Holdings/Do you Own (Print or Audiovisual material)”:

User: Is this book-<http://search.lib.unc.edu/search?R=UNCb4799496> checked out? I couldn't find it when I looked

- Final question: “Policy and Procedural (Directional)”:

Librarian: They do have the book for you at the Circulation desk!

...

Librarian: That's right - At the main desk right in front of the entrance/exit

The rest of the mutable inquiries have many variations, but of the eleven types, there are 7 types that include “Holdings/Do you Own” questions, usually reflecting the urgent need of users for finding specific materials. These situations generate great

expectations from users, and considerable involvement from librarians who try to satisfy those expectations.

In general, it is also important to say that 34% of the “Holdings/Do you Own” questions mutated into “Interlibrary Loan and Document Delivery” questions. This means that in general, 64% of the questions did find the needed resources at UNC.

### *Referrals*

During the Chat session and the reference interview, when librarians don’t have immediate answers, many authors recognize the need of referring users to other sources, such as: appropriate websites, internal or external departments, other services, or more knowledgeable librarians. Ronan (2003) states that not every question can be answered online. Cassell & Hiremath (2011) say that in virtual reference librarians have to make monitored referrals.

As seen in Table 7, of the total of 176 questions, 39 (22%) of them were referred, either to other Chat services in the UNC University Libraries, or to specific contact information (name and E-mail) of other UNC staff (mostly librarians). None of the users was referred to another service outside UNC-CH for some information.

The major percentage (40%) of referrals belongs to the “Policy and Procedural” questions, mostly due to the existence of the “Reserve a Study Room” questions. Most of these questions, when they were received through the Reference Chat box, were referred by the librarian to the Circulation desk of Walter Royal Davis Library, or to other Chat Services of other UNC University Libraries that also have study rooms. An example of these referrals is:

Librarian: Let me transfer you to circulation and they can set that up for you

Table 7  
*Referrals*

CATEGORIES	TOTAL	REFERRALS	% REFERRALS / TOTAL
<b>Reference</b>	<b>25</b>	<b>4</b>	<b>16%</b>
Ready Reference	6	1	17%
Specific Search	19	3	16%
<b>Online Resources</b>	<b>20</b>	<b>5</b>	<b>25%</b>
Resource Operation	1	0	0%
Problems with Access	8	2	25%
Help with UNC Services	11	3	27%
<b>Policy and Procedural</b>	<b>73</b>	<b>29</b>	<b>40%</b>
Directional	18	0	0%
Service Issues	29	11	38%
Administrative Issues	2	1	50%
Special Cases or Personal Issues	5	3	60%
Suggestions / Complaints	0	0	
Reserve a Study Room	19	14	74%
<b>Holdings/Do you Own</b>	<b>32</b>	<b>1</b>	<b>3%</b>
Online Resource or PDF Document	18	1	6%
Print or Audiovisual Material	14	0	0%
Not Determined or any Format	0	0	
<b>Interlibrary Loan and Document Delivery</b>	<b>11</b>	<b>0</b>	<b>0%</b>
Asked to UNC (External users)			
Books or other Print and Audiovisual Material	1	0	0%
Material Scanned or Photocopied or Online Access	0	0	
Asked from UNC (Internal Users)			
Books or other Print and Audiovisual Material	1	0	0%
Material Scanned or Photocopied or Online Access	9	0	0%
<b>Instruction</b>	<b>5</b>	<b>0</b>	<b>0%</b>
Online Resources or Programs	5	0	0%
Orientation	0	0	
<b>Bibliographic Verification and Citation</b>	<b>8</b>	<b>0</b>	<b>0%</b>
<b>Empty</b>	<b>2</b>	<b>0</b>	<b>0%</b>
<b>TOTAL</b>	<b>176</b>	<b>39</b>	<b>22%</b>

The “Online Resources” and the “Reference” questions sometimes required the need of more specialized professionals in other libraries or departments of the UNC University Libraries, which explains the 25% and 16% of referrals, respectively. These referrals were done by the librarians, but in some other cases the librarians indicated to the user the name and contact information of the person they should contact by themselves. Examples of these referrals are:

Librarian: Okay, let me transfer you to our stellar team here at Davis; they’re brilliant – one sec

Or

Librarian: you're welcome. Good luck. And if you want, you can talk to our subject specialist librarian tomorrow and they'll be able to give more specific help...let me find out which librarian it is and get you the contact information...

### *Successful Answers versus Unsuccessful Answers*

As it is illustrated in Table 8, 81% of the total questions were successfully answered by the reference librarians.

Table 8  
*Successful answers*

CATEGORIES	TOTAL	SUCCESSFUL ANSWERS	% SUCCESSFUL ANSWERS / TOTAL
<b>Reference</b>	<b>25</b>	<b>18</b>	<b>72%</b>
Ready Reference	6	4	67%
Specific Search	19	14	74%
<b>Online Resources</b>	<b>20</b>	<b>15</b>	<b>75%</b>
Resource Operation	1	1	100%
Problems with Access	8	5	63%
Help with UNC Services	11	9	82%
<b>Policy and Procedural</b>	<b>73</b>	<b>59</b>	<b>81%</b>
Directional	18	18	100%
Service Issues	29	21	72%
Administrative Issues	2	2	100%
Special Cases or Personal Issues	5	4	80%
Suggestions / Complaints	0	0	
Reserve a Study Room	19	14	74%
<b>Holdings/Do you Own</b>	<b>32</b>	<b>26</b>	<b>81%</b>
Online Resource or PDF Document	18	12	67%
Print or Audiovisual Material	14	14	100%
Not Determined or any Format	0	0	
<b>Interlibrary Loan and Document Delivery</b>	<b>11</b>	<b>11</b>	<b>100%</b>
Asked to UNC (External users)			
Books or other Print and Audiovisual Material	1	1	100%
Material Scanned or Photocopied or Online Access	0	0	
Asked from UNC (Internal Users)			
Books or other Print and Audiovisual Material	1	1	100%
Material Scanned or Photocopied or Online Access	9	9	100%
<b>Instruction</b>	<b>5</b>	<b>5</b>	<b>100%</b>
Online Resources or Programs	5	5	100%
Orientation	0	0	
<b>Bibliographic Verification and Citation</b>	<b>8</b>	<b>8</b>	<b>100%</b>
<b>Empty</b>	<b>2</b>	<b>0</b>	<b>0%</b>
<b>TOTAL</b>	<b>176</b>	<b>142</b>	<b>81%</b>

Successful Answers are the ones that fully respond to the users' inquiries. Users are very polite and they always thank the librarians for the service received, but sometimes they don't get the information they were looking for, and in this case they receive Unsuccessful Answers.

The “Interlibrary Loan and Document Delivery”, “Instruction” and “Bibliographic Verification and Citation” questions obtained 100% of successful answers.

However, the “Policy and Procedural” and “Holdings/Do you Own” questions obtained 81% of success, the “Online Resources” questions a 75%, and the “Reference” questions only a 72%.

In some cases the librarian didn’t know the answer, and the user didn’t have the patience to explain:

Librarian: I’m not familiar with Chare web. If you could tell me what it is, I will check for you

In other cases, the librarian couldn’t answer immediately and promised to follow up:

Librarian: you are welcome. We will get back to you, but it may take some time. Are you under any deadline pressure?

These percentages have also some relation with the referred questions, especially in the case of the “Policy and Procedural” ones. Some of them didn’t get an immediate answer and they were not considered successful. In 1 case it seems that the user didn’t have the patience to wait for the librarian’s answer that took too long. Some other questions (4) were interrupted when the librarian intended to transfer the Chat session, which according to Mr. Chad Haefele may be caused by either of the following alternatives:

The patron closed the chat before the transfer was completed, or the destination of the transfer never picked up to answer the question. I checked some recent transferred chats and verified that transferred chats should all show up in one transcript. So I don’t think it’s a system error. Unfortunately it’s impossible for us to tell which one of the above options is the case from our logs. (personal communication, November 28, 2012)



### *E-mail Reference Questions*

Table 9 illustrates the 155 questions received through the 150 E-mail sessions. There were no mutable inquiries, and in only 5 E-mails, 2 related questions were asked by the users.

Table 9  
*Questions received by e-mail*

CATEGORIES	NUMBER	%
<b>Reference</b>	<b>31</b>	<b>20%</b>
Ready Reference	20	13%
Specific Search	11	7%
<b>Online Resources</b>	<b>24</b>	<b>15%</b>
Resource Operation	10	6%
Problems with Access	14	9%
Help with UNC Services	0	0%
<b>Policy and Procedural</b>	<b>55</b>	<b>35%</b>
Directional	7	5%
Service Issues	17	11%
Administrative Issues	10	6%
Special Cases or Personal Issues	13	8%
Suggestions / Complaints	8	5%
Reserve a Study Room	0	0%
<b>Holdings/Do you Own</b>	<b>20</b>	<b>13%</b>
Online Resource or PDF Document	6	4%
Print or Audiovisual Material	5	3%
Not Determined or any Format	9	6%
<b>Interlibrary Loan and Document Delivery</b>	<b>17</b>	<b>11%</b>
Asked to UNC (External users)		
Books or other Print and Audiovisual Material	6	4%
Material Scanned or Photocopied or Online Access	9	6%
Asked from UNC (Internal Users)		
Books or other Print and Audiovisual Material	1	1%
Material Scanned or Photocopied or Online Access	1	1%
<b>Instruction</b>	<b>7</b>	<b>5%</b>
Online Resources or Programs	5	3%
Orientation	2	1%
<b>Bibliographic Verification and Citation</b>	<b>1</b>	<b>1%</b>
<b>Empty</b>	<b>0</b>	<b>0%</b>
<b>TOTAL</b>	<b>155</b>	<b>100%</b>

The transcripts of the E-mail sessions were much shorter than the ones from the Chat sessions, because there was no opportunity for the reference interview and users didn't have the opportunity of immediate feedback from the librarians. As users don't have the pressure of time to write, the paragraphs were longer than in the Chat sessions, and the questions were formulated all at once, with less misspelling errors.

On the other hand, responses from the librarians went in separate E-mails, and are not included in this study, so there was no possibility to find out if the users were referred or received successful answers.

Attending to Table 9, it is interesting to notice that also in the E-mail sessions users ask more “Policy and Procedural” questions, which represent 35% of the total. They are followed by “Reference” questions that represent 20% of the total, and then by “Online Resources” (15%), “Holdings/Do you Own” (13%), “Interlibrary Loan and Document Delivery” (11%), “Instruction” (5%), “Bibliographic Verification and Citation questions” (1%).

Even though the users didn’t identify themselves, through their questions it was possible to detect that there were more external users (not UNC) sending E-mails, than initiating Chat sessions.

To illustrate some of the questions received by E-mails, some examples of each kind of question are given, which are reproduced exactly how they were written by the users, some of them with misspellings.

- Reference

- Ready Reference

User: In the journal “Art Union” (1839-1848)- -in storage- -how many plates appeared in a typical monthly issue? I need the number of plates in any monthly issue you choose.

- Specific Search

User: I am interested in finding records of slaves who were owned by Gov. Johnston during the late 1700’ and early 1800’s

- Online Resources

- Resource Operation

User: ...I am not sure if there is some way to get refworks to behave more like the pubmed search engine. Thank you for your help.

- Problems with Access

User: I am currently studying abroad and each time I try to access UNC's e-research tools the log-in ends with an error message. Are the research tools available while abroad? Thank you!

- Help with UNC Services: There are no questions for this category.

- Policy and Procedural

- Directional

User: We have been told that an exhibit consisting of a masonic apron and other memorabilia of the McCauleys is on the campus. Our question is which campus.

- Service Issues

User: What do I need to provide in order to purchase a library card and how much does the card cost? I am a professor emeritus from Case Western Reserve University seeking an opportunity to access you [your] library materials.

- Administrative Issues

User: I have just received a Purchase Order #[confidential information] from your Monographic Services Dep't CB# 3902, Davis library for VOICES & IMAGES FROM BULGARIA. While the price is \$50.00 there is also a shipping/postage charge of \$5.00. The total invoice is \$55.00. Is this understood?

- Special Cases or Personal Issues

User: I have a book that has been labeled lost but now I have the original copy I rented. If I bring it back will it be 25\$ rather than the 100\$?

- Suggestions / Complaints

User: I just would like to complain about the Davis library hours on the Friday of exam week. Yes, it is a Friday. But my Saturday

exams matter just as much as the ones on any other day of the week. If it's during exams, you guys should be open until 2.

- Reserve a Study Room: There are no questions for this category.
- Holdings/Do you Own
  - Online or PDF

User: Does UNC have available audiobooks for online download? If so, how do I look them up/access?

- Print or Audiovisual

User: I am looking for print issues of the Saturday Evening Post, volume 188 (Jan-June 1916).

- Not Determined or any Format

User: Can I get a copy of Venture Philanthropy: Value Added Investment or Administrative Annoyance? It's a 2004 MA thesis by Rebecca Wyhof.

- Interlibrary Loan and Document Delivery
  - Asked to UNC (External Users)

#### Books or other Print and Audiovisual Material

User: I am Deputy Librarian of the [confidential information] belonging to the Free University in [confidential information]. One of our professors needs a copy of the following title that unfortunately is not held in German libraries neither sold by antiquarian booksellers: Viner, Jacob: Lectures in economics 301: price distribution theory, 1930.

#### Material Scanned or Photocopied or Online Access

User: WorldCat led me to your catalog, which seems to indicate that you won bound volumes for Leslie's Weekly including the date November 2, 1905. I am trying to acquire a digital color scan of the cover of this issue

- Asked from UNC (Internal Users)

#### Books or other Print and Audiovisual Material

User: I'm a graduate student working on my dissertation, so I've obviously been requesting a lot of books. I also realize that the whole ILL system is being worked on this month. Tonight, I see that I can't log in to request an ILL book through Academic Affairs. Does this mean that I can't request books at all or only that I can't request them via the online form? Can I make the request in person at the main desk?

#### Material Scanned or Photocopied or Online access

User: I was wondering if it is possible to obtain the following standard through UNC Libraries or interlibrary loan.  
<http://www.astm.org/Standards/E308.htm>

- Instruction

- Online Resources or Programs

User: Do any of the libraries offer a course/training in citation management systems, such as Endnote or Reference Manager, for UNC staff?

- Orientation

User: I am teaching Anthropology 330 this semester, an undergrad seminar about modern Japan. I would like to schedule a visit to Davis library with my students to help them learn about the East Asia and Anthropology. Would it be possible to meet with a research librarian during our class hours?

- Bibliographic Verification and Citation

User: A research librarian at the Univ. of Illinois suggested I write to you to see if you might supply me with a bibliographic citation from a book I used in Paris but do not have available here in Edinburgh.

- Empty: There are no questions for this category.

## **Discussion of Results**

The Chat sessions were longer (more paragraphs) than the E-mails received, and 21 sessions (14%) of the 150 Chat sessions contained more than 1 question: 16 sessions contained 2 questions, and 5 sessions contained 3 questions. Due to the reference interview, from the 21 sessions that contained 2 or 3 questions, 19 (90%) contained mutable inquiries. Of the total of 176 questions contained in the 150 chat sessions, 39 questions (22%) were referred to other UNC Chat services or to other UNC staff. Due mostly to some of these referrals, 34 questions (19%) received unsuccessful answers.

The E-mails received were shorter than the Chat sessions, but contained longer and better structured paragraphs. Only 5 E-mails (3%) from the 150 received contained 2 questions. So in total, 155 questions were received. There was no opportunity to collect the answers to those E-mails, so it is not known if they were successfully answered.

Reflecting the literature reviewed for this study and to the content of the questions included in the sample, 8 broad categories or 22 specific categories of questions were created for the Chat Reference Service and for the E-mail Reference Service. Of the 22 specific categories, only 15 categories are common to both services.

### ***Different Categories of Questions***

Due to the special characteristics of both services, there were some questions that were not asked in the Chat Reference Service and others that were not asked in the E-Mail Reference Service:

- The Chat Reference Service didn't receive any "Policy and Procedural (Suggestions / Complaints)" or "Instruction (Orientation)" questions. In these

cases probably the users wanted a more formal instance of communication, in which the questions they asked could be saved and followed up by them.

This service neither received any “Holdings/Do you Own (Not Determined or any Format)” questions because during the Chat session it was possible to clarify any vague requests for information. On the other hand, external users didn’t ask any “Interlibrary Loan and Document Delivery (Asked to UNC, Material Scanned or Photocopied or Online Access)” questions, which may mean that the Chat Reference Service is more used by Internal Users and that the E-mail Reference Service by External Users, fact that can also be inferred by some other questions analyzed.

- The E-mail Reference Service didn’t receive any “Online Resources (Help with UNC Services)”, “Policy and Procedural (Reserve a Study Room)”, and “Empty” questions. In the first 2 cases it could be explained by the urgency that users had for immediate answers, which could only be satisfied by Chat. “Empty” questions were not received through E-mail questions, because probably people send E-mails without the pressure of time and with revised content. On the other hand, it seems much easier to initiate a Chat session and then interrupt it for any reason, without giving any further explanation.

### ***Different Number and Percentage of Questions***

Besides of having different categories for both virtual reference services (Chat and E-mail), there are also differences in the number of questions and percentages that

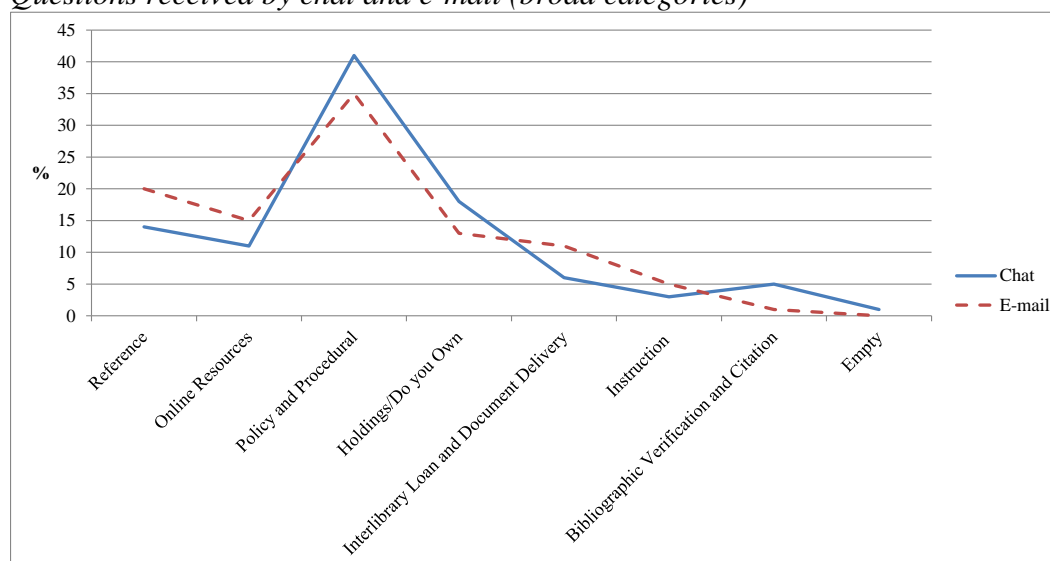
each category represents for each service, which determines the place or importance that each category has within that service.

As it is possible to observe in Figure 1, the 8 broad categories defined for both services are the same, but comparing the percentages they represent for each one of them it is possible to say that:

- Users ask more “Policy and Procedural”, “Holdings/Do you Own”, “Bibliographic Verification and Citation”, and “Empty” questions through the Chat Reference Service.
- Users ask more “Reference”, “Online Resources”, “Interlibrary Loan and Document Delivery”, and “Instruction” questions through the E-mail Reference Service.

Figure 1

*Questions received by chat and e-mail (broad categories)*



In Table 10, it can be appreciated that the Chat Reference Service received more questions (176) than the E-mail Reference Service (155), even though the same amount



of transcripts was analyzed for both services (150). This is due to the fact that Chat is interactive and allows many questions per session, most of them being mutable inquiries.

Table 10

*Questions received by chat and e-mail (broad categories)*

CATEGORIES	CHAT		E-MAIL	
	Number	%	Number	%
Reference	25	14%	31	20%
Online Resources	20	11%	24	15%
Policy and Procedural	73	41%	55	35%
Holdings/Do you Own	32	18%	20	13%
Interlibrary Loan and Document Delivery	11	6%	17	11%
Instruction	5	3%	7	5%
Bibliographic Verification and Citation	8	5%	1	1%
Empty	2	1%	0	0%
<b>TOTAL</b>	<b>176</b>	<b>100%</b>	<b>155</b>	<b>100%</b>

If we look at Table 10, but also at Table 11, and we analyze the types of questions asked in the Chat Reference Service and in the E-mail Reference Service, it is possible to observe some similarities in both services:

Table 11

*Order of questions received by chat and e-mail*

ORDER	PLACE	CHAT QUESTIONS	E-MAIL QUESTIONS
1	1	Policy and Procedural (41%)	Policy and Procedural (35%)
2	2	Holdings/Do you Own (18%)	Reference (20%)
	3	Reference (14%)	Online Resources (15%)
	4	Online Resources (11%)	Holdings/Do you Own (13%)
3	5	Interlibrary Loan and Document Delivery (6%)	Interlibrary Loan and Document Delivery (11%)
	6	Bibliographic Verification and Citation (5%)	Instruction (5%)
	7	Instruction (3%)	Bibliographic Verification and Citation (1%)
4	8	Empty (1%)	Empty (0%)

- The “Policy and Procedural” questions represent the larger amount and percentage of the sample in both virtual reference services, and in both services (excluding the “Reserve a Study Room” questions that are only present in the Chat) the number of questions asked is similar: 54 through Chat and 55 through E-mail.
- Then, the “Reference”, “Online Resources”, and “Holdings/Do you Own” questions are in second order. It is important to notice that the Reference

Transactions, represented in general by the “Reference” questions, do not constitute the majority of questions asked by users in both services.

- The “Interlibrary Loan and Document Delivery”, “Instruction”, and “Bibliographic Verification and Citation” are in third order, which are the questions that are less asked in both services.
- The “Empty” questions only apply for the Chat Reference Service and represent a little percentage of the sample.

However, there are also some differences between the types of questions asked through the two virtual reference services:

- The “Reference”, “Online Resources”, “Interlibrary Loan and Document Delivery” and “Instruction” questions represent a larger number and percentage of the sample in the E-mail Reference Service than in Chat Reference Service.
- The “Policy and Procedural” (including “Reserve a Study Room”), “Holdings/Do you Own”, “Bibliographic Verification and Citation”, and “Empty” questions represent a higher number and percentage of the sample in the Chat Reference Service than in E-mail Reference Service.

Going more into detail, Table 12 also illustrates the subcategories or specific categories of each broad category.

So, looking at Table 12 it is possible to say that for the Chat Reference Service:

- The “Policy and Procedural (Service Issues)” questions are in first place.

- The “Reference (Specific Search)”, which are Reference Transactions, and “Policy and Procedural (Reserve a Study Room)” questions are in second place.
- The “Policy and Procedural (Directional)” and “Holdings/Do you Own (Online Resource or PDF Document)” are in third place.

Table 12

*Order of questions received by chat and e-mail*

CATEGORIES	CHAT QUESTIONS		CATEGORIES	E-MAIL QUESTIONS	
	Number	%		Number	%
Policy and Procedural - Service Issues	29	16%	Reference - Ready Reference	20	13%
Reference - Specific Search	19	11%	Policy and Procedural - Service Issues	17	11%
Policy and Procedural - Reserve a Study Room	19	11%	Online Resources - Problems with Access	14	9%
Policy and Procedural - Directional	18	10%	Policy and Procedural - Special Cases or Personal Issues	13	8%
Holdings/Do you Own - Online Resource or PDF Document	18	10%	Reference - Specific Search	11	7%
Holdings/Do you Own - Print or Audiovisual Material	14	8%	Policy and Procedural - Administrative Issues	10	6%
Online Resources - Help with UNC Services	11	6%	Online Resources - Resource Operation	10	6%
Interlibrary Loan and Document Delivery - Asked from UNC - Material Scanned or Photocopied or Online Access	9	5%	Holdings/Do you Own - Not Determined or any Format	9	6%
Online Resources - Problems with Access	8	5%	Interlibrary Loan and Document Delivery - Asked to UNC - Material Scanned or Photocopied or Online Access	9	6%
Bibliographic Verification and Citation	8	5%	Policy and Procedural - Suggestions / Complaints	8	5%
Reference - Ready Reference	6	3%	Policy and Procedural - Directional	7	5%
Policy and Procedural - Special Cases or Personal Issues	5	3%	Holdings/Do you Own - Online Resource or PDF Document	6	4%
Instruction - Online Resources or Programs	5	3%	Interlibrary Loan and Document Delivery - Asked to UNC - Books or other Print and Audiovisual Material	6	4%
Policy and Procedural - Administrative Issues	2	1%	Holdings/Do you Own - Print or Audiovisual Material	5	3%
Empty	2	1%	Instruction - Online Resources or Programs	5	3%
Online Resources - Resource Operation	1	1%	Instruction - Orientation	2	1%
Interlibrary Loan and Document Delivery - Asked to UNC - Books or other Print and Audiovisual Material	1	1%	Interlibrary Loan and Document Delivery - Asked from UNC - Material Scanned or Photocopied or Online Access	1	1%
Interlibrary Loan and Document Delivery - Asked from UNC - Books or other Print and Audiovisual Material	1	1%	Bibliographic Verification and Citation	1	1%
Policy and Procedural - Suggestions / Complaints	0	0%	Interlibrary Loan and Document Delivery - Asked from UNC - Books or other Print and Audiovisual Material	1	1%
Holdings/Do you Own - Not Determined or any Format	0	0%	Policy and Procedural - Reserve a Study Room	0	0%
Interlibrary Loan and Document Delivery - Asked to UNC - Material Scanned or Photocopied or Online Access	0	0%	Online Resources - Help with UNC Services	0	0%
Instruction - Orientation	0	0%	Empty	0	0%
<b>TOTAL</b>	<b>176</b>	<b>100%</b>	<b>TOTAL</b>	<b>155</b>	<b>100%</b>

And for the E-mail Reference Service, in Table 12 it can be appreciated that:

- The “Reference (Ready Reference)” questions, which are Reference Transactions, are in first place.
- The “Policy and Procedural (Service Issues)” questions are in second place.
- The “Online Resources (Problems with Access)” questions are in third place.
- The “Policy and Procedural (Special Cases or Personal Issues)” questions are in fourth place.
- The “Reference (Specific Search)” questions are in fifth place.

### ***Reference Transactions***

It is interesting to observe that questions related to the traditional function of librarians and that require greater expertise and complete answers, such as “Reference” and “Instruction” questions, are still asked in greater amount through the E-mail Reference Service.

However, of all the questions, only 14% and 20% of the questions asked by users in the Chat Reference Service and in the E-mail Reference Service respectively are “Reference” questions or Reference Transactions.

### ***Categories of Questions and their Function***

Analyzing the number and percentage of questions asked in both services for each category, some functions can be related to them.

For both virtual reference services, Chat and E-mail, the types of questions asked are related to the following functions:

- Operation of the Library: “Policy and Procedural (Service Issues)” are the most common questions asked in both services (Chat and E-mail), which are in direct relation to the services the libraries have to offer, but that don’t need specialized staff to answer them. Also, it is important to notice that the types of questions asked from users depend on the particular services the library offers, and the example that best illustrates this are the “Reserve a Study Room” questions received by the Chat Reference Service.
- Searching: “Reference” questions are asked in both services. However, in general, users continue preferring the E-mail Reference Service to ask “Reference” questions. These kinds of questions are considered as Reference Transactions.

In the case of the E-mail Reference Service, “Ready Reference” questions are in first place. This is probably because users need a straight answer to concrete questions.

In the Chat Reference Service, “Specific Search” questions are in second place, probably due to the fact that users have a vague idea of what they want and prefer immediate interaction with librarians. This would answer the question made when analyzing the Chat Reference Transcripts, and yes, this study proves that Reference Transactions are still prevalent and that they constitute one of the core functions of reference librarians.

For Chat Reference Service, the types of questions asked are related to the following functions:

- **Finding Material:** Finding material in a quick way remains being vital for users, especially the ones in electronic format, and this is demonstrated by the “Policy and Procedural (Directional) and “Holdings/Do you Own (Online Resource or PDF Document)” questions that are received by Chat.
- **Using the Library Facilities:** “Policy and Procedural (Reserve of a Study Room)” is a frequently asked question that seems not to be canalized through any other way in the library, even though there is a web page for doing so placed on the Davis Library website.

For E-mail Reference Service, the types of questions asked are related to the following function:

- **Help with Library Services:** Solving personal problems and having them documented is very important, which is demonstrated by the “Online Resources (Problems with Access)” and the “Policy and Procedural (Special Cases or Personal Issues)” questions received by E-mail. Also, it is important to notice that “Policy and Procedural (Suggestions / Complaints) are only received by E-mail. So, it seems that users still feel that E-mail offers a more confident way to obtain well informed responses.

### **Summary and Conclusions**

The results of the present study answer its Research Questions, which are:

1. What categories of questions do users ask through Chat Reference Service?
2. What categories of questions do users ask through E-mail Reference Service?

3. Are the categories of questions that users ask through Chat Reference Service different from the questions they ask through E-mail Reference Service?
4. Are the categories of questions asked through both virtual reference services only Reference Transactions?

Attending to the discussion of results and comparing both virtual reference services (Chat and E-mail), it is possible to infer that the value of immediacy plays an important role in the Chat Reference Service, where users expect quick and fast answers. The Chat Reference Service provides users of an informal way of communication, advantage that seems to be more used by Internal Users. The Chat Reference Service also provides the opportunity for librarians to conduct a reference interview, which allows users to clarify their initial question and complete their request asking more related questions (mutable inquiries). Chat sessions also allow librarians to immediately refer users to other services or library staff, which not always assures a successful answer.

As a result, the Chat Reference Service is greatly used for “Specific Search” questions (a type of Reference Transaction), “Policy and Procedural (Reserve a Study Room)”, “Policy and Procedural (Directional)”, and “Holdings/Do you Own, (Online Resource or PDF Document)” questions. These are questions that deal with searching about a specific topic, finding print and online resources, and using the library facilities.

On the other hand, the E-mail Reference Service provides a formal way of communication that is more trusted by users that ask short and straight questions and that prefer more structured and well informed answers. It continues to be a valid tool for users that ask questions related to the traditional functions of librarians: reference

transactions, instruction, permanent access to library services, and help with library services in general.

As a result, the E-mail Reference Service is greatly appreciated for “Ready Reference” questions (a type of Reference Transaction), “Online Resources (Problems with Access)”, and “Policy and Procedural (Special Cases or Personal Issues)” questions. These are questions that deal with searching information resources, as well as with library services and personal issues.

The “Policy and Procedural” questions are the first ones asked in both virtual reference services. The “Reference” questions, characterized in this paper as Reference Transactions, come in second place. These two facts put together means that reference points of service receive other questions different that Reference Transactions, and that they are also used for users as information desks.

The present study also confirms the hypothesis: *Because of the characteristics of the different means, the categories of questions asked by users through the Chat Reference Service and through the E-mail Reference Service are also different, and include more than Reference Transactions.*

It was found out that:

- There are some specific categories of questions that are asked in one Reference Service and not in the other.
- In the case of the categories that are the same in the two virtual reference services, the percentage that each category represents in each service differs.

This means that the distribution of the questions within the categories is



different between the Chat Reference Service and the E-mail Reference Service.

- There is a whole variety of questions asked by users in the Chat and E-mail Reference Services, which are not only Reference Transactions, as RUSA of the American Library Association (2008) understands the concept. The “Reference” questions don’t represent more than 20% in both reference services. It was clear in this study that not all the questions that users ask are Reference Transactions or reference questions, as defined by Reference and User Services Association (RUSA) of the American Library Association (2008). So, the questions are much broader and include different issues.

### *Suggestions for SIBUC*

As the results and conclusions of this study will help to develop the Chat Reference Service at the Library System of Pontificia Universidad Catolica de Chile (SIBUC), the present paper recommends some suggestions for its proper implementation. Even though SIBUC already has an E-mail Reference Service, additional measures should be taken if a Chat Reference Service is implemented.

In general, reference librarians should be trained not to only respond to Reference Transactions in a fast and successful way, but also to respond to a whole variety of other types of questions, which implies a complete understanding of the services that the library offers, and the knowledge of some other administrative and technical issues. Communication and information skills are needed to provide a successful service, but also good criteria and expertise.

In relation to the specific questions that users ask through the Chat Reference Service, the following measures should be taken:

- “Specific Search”, “Holdings/Do you Own” and “Instruction” questions:

Reference librarians should be trained to quickly respond to general questions about specific topics, and also to help users how to find material in the library sources. But these types of questions should be also be accompanied by instruction provided to the user by librarians. To help librarians accomplish this task, SIBUC should have training sessions with sample sessions and empirical exercises taken out from this study. Librarians should be trained to maintain the user informed about the steps they are taking to find the information needed, so in this way users will be able to replicate the process by their own if they need further information.

Also, as these kinds of questions are more related to Reference Transactions, librarians should be trained in conducting a proper reference interview. As we have seen in the present study, the Chat Reference Service, with its own particular characteristics completely allows this kind of interaction. So, a chat session is properly managed if it follows all the steps defined for an online reference interview: greeting and initial inquiry, negotiation process, searching, keeping the user informed, communicating results, referring, follow-up, and closing (the librarian must close the session, asking for feedback).

To help develop more autonomous users, basic online tutorials should be placed in the website, and more workshops should be offered to the academic units.

Along with that, SIBUC should develop print and online guides for librarians, which would allow them to give fast and successful answers.

- “Policy and Procedural” and “Interlibrary Loan and Document Delivery” questions: SIBUC would try to decrease the number of these questions in the Chat Reference Service, because these are questions that can be answered by non-professional staff and not necessarily by librarians. To do that, SIBUC should increase the information provided to users through its website, and also through print and audiovisual material in the libraries.

Updated online information, well placed and immediately visible in the website, print brochures, better signs and quick videos in the libraries should instruct the user on how to use the libraries and its services.

Also, to avoid that librarians help with procedures that should be done online by users, such as “Reserve a Study Room”, “Interlibrary Loan and Document Delivery”, or other particular services that have great demand, SIBUC should make them visible in the website’s Home Page.

At the end, and to train users, if “Policy and Procedural” questions like these are asked, librarians should refer users to the webpage that contains the information needed. In this way, users would increase their knowledge about what libraries have to offer them and where to find the proper information.

In this way, reference librarians would better use their time answering Reference Transactions.

- “Online Resources” questions: This type of questions deal with a broad spectrum of issues related to the online resources and services that the library has on its website. So, to respond to them, reference librarians should have some technological and informational skills, as well as the capability and privileges to access the users’ accounts to solve some specific and personal problems.

Special training should be done taking into considerations the special characteristics of the services provided by the particular organization, and the different situations that the users may be involved in. As UNC University Libraries offer different services than SIBUC, to train librarians, some examples could be taken from the questions received through E-mail at SIBUC. Also, some more examples could be taken at the beginning, when the Chat Reference Service starts its normal operation.

- “Bibliographic Verification and Citation” questions: In this case, librarians should be trained to answer questions about some of the most common formatting and citation styles, such as MLA or APA. Guides in Spanish should be placed in the website, and print books, handbooks and manuals should be available in the libraries. It is recommended that some workshops should be also offered in these particular topics.

As the questions that are referred usually have unsatisfactory and delayed answers; referrals should be done only when it is strictly necessary, and some kind of

follow-up procedure should be implemented. In order to help reference librarians do the correct referrals and on time, SIBUC has to develop for them quick guides with useful tips, persons and resources.

Finally, if SIBUC wants to implement the Chat Reference Service, it has to make sure that the technological system that supports it allows the management of queues and referrals, as well as other administrative and controlling functions that assure a good quality of service in the least amount of time.

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